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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))

Attorney Docket No. 566.38876X00

First Inventor or Application Identifier Kazuhiro KUSAMI

Title SERVICE RESERVATION SYSTEM

Express Mail Label No.

APPLICATION ELEMENTS
See MPEP chapter 600 concerning utility patent application contents

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(preferred arrangement set forth below)
- Descriptive title of the Invention
 - Cross References to Related Applications
 - Statement Regarding Fed sponsored R & D
 - Reference to Microfiche Appendix
 - Background of the Invention
 - Brief Summary of the Invention
 - Brief Description of the Drawings (if filed)
 - Detailed Description
 - Claim(s)
 - Abstract of the Disclosure
3. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 26]
4. Oath or Declaration [Total Pages 1]
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(for continuation/divisional with Box 16 completed)
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5. ☐ Microfiche Computer Program (Appendix)
6. Nucleotide and/or Amino Acid Sequence Submission
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ACCOMPANYING APPLICATION PARTS

7. ☐ Assignment Papers (cover sheet & document(s))
8. ☐ 37 C.F.R. § 3.73(b) Statement of Power of Attorney
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9. ☐ English Translation Document (if applicable)
10. ☐ Information Disclosure Statement (IDS)/PTO-1449 [Copies of IDS Citations]
11. ☐ Preliminary Amendment
12. ☒ Return Receipt Postcard (MPEP 503)
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13. ☐ * Small Entity Statement(s) filed in prior application
(PTO/SB/09-12) Status still proper and desired
14. ☐ Certified Copy of Priority Document(s)
(if foreign priority is claimed)
15. ☒ Other: FIGS. 1-26

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used to supply network-utilized services, to users poses problems.

For example, a service for supplying the contents of data, which are formed of video data, such as a motion picture, received from a provider thereof and accumulated, and supplied to plural users in accordance with the users' requests by utilizing a network will be discussed. The users' requests are concentrated on a time zone, for example, 20:00-21:00 during which many ordinary people enjoy a motion picture.

10 If a necessary amount of resources for a network for transmitting the contents of data to users are prepared in accordance with a time zone on which the users' requests for reservation are concentrated, an amount of resources which are not used in other time zones will increase, so that a general
15 resource utilization efficiency will decrease. On the other hand, if only a smaller amount of resources are prepared, the resource utilization efficiency is improved but the number of users' requests for reservation denied in a time zone on which the user's requests for reservation are concentrated will
20 increase. This will cause the degree of users' satisfaction concerning the services to lower. Especially, the utilization of the services comes to be denied at the very time at which a request for reservation is actually made, i.e., at the very time at which the users actually utilize the services.
25 Therefore, the degree of dissatisfaction concerning the

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a method having the steps of determining the degree of importance of the reservations on the basis of the personal information on the users, and taking reservations with priority given to the reservations of higher degrees of importance.

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SUMMARY OF THE INVENTION:

When earlier-accepted reservations are taken preferentially in a method in which reservations are taken in advance to supply services within the range of the reservations taken, later-accepted reservations of higher degrees of importance are denied in some cases. In this case, the dissatisfaction of the users the reservations of whom have been denied in spite of the high importance thereof increases.

According to the method of preferentially taking reservations of higher degrees of importance, the necessity of denying already-accepted reservations occurs so as to accept requests, which are made afterward, for reservations the degrees of importance of which are higher than those of the already-accepted reservations. In such a case, the dissatisfaction of users whose reservations once accepted have been denied increases.

In order to improve the resource utilization rate, it is necessary that the utilization of services be leveled with respect to both the time and resources. However, when the determination of the contents of the reservations of services

has been left to the users who cannot grasp the general condition of reservations, it is impossible to expect the leveling of the sufficient or efficient utilization of resources.

Therefore, the present invention aims at optimizing the
5 resource utilization rate and the degree of satisfaction of
users concerning the utilization of services.

To be exact, the present invention aims at, for example, supplying services so as not to cause the degree of users' satisfaction concerning the utilization of the services to decrease with a predetermined high resource utilization efficiency maintained, or at leveling the users' utilization of the services with the supplying of services with which users are satisfied to a predetermined extent.

The present invention provides a service reservation system capable of eliminating these problems, and adapted to accept from users requests for reservations for utilizing services supplied by using resources.

The service reservation system is provided with a reservation condition management element adapted to manage accepted reservations of services as reservation condition, an acceptance element adapted to accept service booking requests from users, an importance determining element for determining in accordance with preset specifications the degree of importance of the service booking requests accepted by the acceptance element, and a reservation taking element adapted

to deny the acceptance of the service booking requests iff the degree of importance of the service booking requests determined by the importance degree determining element is lower than a predetermined importance degree determined by a predetermined standard, and to permit the acceptance of the service booking requests if the degree of importance of the service booking requests determined by the importance determining element is not lower than the predetermined degree, when a load level of resources used for supplying object services of the service booking requests accepted by the acceptance element and determined depending upon the reservation condition managed by the reservation condition management element is higher than a predetermined level.

The resources referred to above include resources in every meaning of the word which are used in the supplying of services, such as time resources, physical resources and logical resources.

According to the service supplying system, a predetermined load range of resources is secured for the service booking requests of a higher degree of importance. Therefore, the service booking requests of a high degree of importance can be accepted at a high probability without canceling the service booking requests of a low degree of importance after the requests have once been accepted.

According to another aspect of the present invention,

the service reservation system is provided with a reservation condition management element adapted to manage accepted reservations of services as reservation condition, a first acceptance element adapted to accept service booking requests from users, a substitute reservation plan preparation element adapted to prepare at least one substitute reservation plan, which is obtained by at least partially altering the contents of reservation in the reservation booking requests accepted by the first acceptance element, in such a manner that a general resources utilization efficiency increases, in accordance with the contents of the reservation and a load level of resources used for the supplying of the object services of the reservation booking requests, said load level being determined by the reservation condition managed by the reservation condition management element, a substitute reservation plan presentation element adapted to present at least one substitute reservation plan prepared by the substitute reservation plan preparation element, to the users, a second acceptance element adapted to accept the users' selection of the at least one substitute reservation plan, and a reservation element adapted to accept as reservation the substitute reservation plan whose selection is accepted by the second selection acceptance element.

According to the service reservation system, a substitute reservation plan is prepared which enables a general resource utilization efficiency to increase in accordance with the load

level of resources used for the supplying of the object services of the reservation booking requests and the contents of the reservation requested by the users, and the utilization of the services according to the substitute reservation plan is recommended to the users, whereby it becomes possible to induce the users to make reservation of the services according to the substitute reservation plan and thereby increase the resource utilization efficiency. When this substitute reservation plan in this system is prepared so that the plan has parts in which much consideration is given to the contents of reservation requested by the users, in accordance with the contents concerned, the degree of users' satisfaction can be secured to a certain extent.

Therefore, according to the present invention, the reservation of services in which the resource utilization efficiency and the degree of users' satisfaction concerning the utilization of the services are optimized can be attained.

BRIEF DESCRIPTION OF THE DRAWINGS:

Preferred embodiments of the present invention will be described in detail on the basis of the following figures, wherein:

Fig.1 is a block diagram showing the configuration of an embodiment of the service supply system according to the present invention;

Fig.2 is a block diagram showing a concrete example of the configuration of the embodiment of the service supply system according to the present invention;

Fig.3 is a block diagram showing the configuration of an electronic computer capable of being used as hardware of each computer in the embodiment of the present invention;

Fig.4 illustrates a processing sequence of each part in a reserved service selection receiving operation of an embodiment of the present invention;

Fig.5 is a flow chart showing a procedure of a processing operation of a request for service analysis unit in a service synopsis providing sequence in the embodiment of the present invention;

Fig.6 is a diagram showing contents of a users' attribute table in the embodiment of the present invention;

Fig.7 is a diagram showing contents of a service attribute table in the embodiment of the present invention;

Fig.8 is a diagram showing a screen displaying the synopsis of reservation-acceptable services in the embodiment of the present invention;

Fig.9 is a flow chart showing a procedure of a processing operation of the request for service analysis unit in a service selection accepting sequence in the embodiment of the present invention;

Fig.10 is a diagram showing an initial screen for the

Fig.11 is a diagram showing a processing sequence in each part in a service reservation operation of the embodiment of the present invention;

Fig.13 is a flow chart showing a procedure of a processing operation of a service reservation management computer in the tentative service reservation sequence in the embodiment of the present invention;

Fig.14 is a flow chart showing the procedure of a processing operation of a service resources allotment management computer in a tentative service reservation sequence in the embodiment of the present invention;

Fig.15 is a diagram showing a service operating policy in the embodiment of the present invention;

Fig.16 is a diagram showing contents of a data accumulation resource management table in the embodiment of the present invention;

Fig.17 is a diagram showing contents of a data producing resources management table in the embodiment of the present invention;

Fig.18 is a diagram showing contents of a reservation

[illegible]

management table in the embodiment of the present invention;

Fig.19 is a flow chart showing a procedure of a processing operation of a service reservation unit in a tentative service reservation sequence in the embodiment of the present invention;

5 Fig.20 is a flow chart showing a procedure of a processing operation of a service reservation management computer in a service reservation sequence in the embodiment of the present invention;

10 Fig.21 is a flow chart showing a procedure of a processing operation of the service resources allotment management computer in the service reservation sequence in the embodiment of the present invention;

15 Fig.22 is a diagram showing a processing sequence of each part in a service execution control operation in the embodiment of the present invention;

Fig.23 is a flow chart showing a procedure of a processing operation of the request for service analysis unit in a service execution control starting sequence in the embodiment of the present invention;

20 Fig.24 is a flow chart showing a procedure of a processing operation of a service execution control unit in a service execution control sequence in the embodiment of the present invention;

25 Fig.25 is a flow chart showing a procedure of a processing operation of a service execution management computer in the

Fig.26 is a flow chart showing a procedure of a processing operation of the service resources allotment management computer in the service execution control sequence in the embodiment of the present invention.

An embodiment of the present invention will now be
10 described.

As shown in the figure, the service supply system of this embodiment has a high function network 100, end users' computers 15 1 utilizing the service supplied by the high function network 100, a management computer group 300 adapted to manage and process various kinds of condition concerning the supplying of services, and a service supply management computer 2 adapted to control the reservation and execution of services.

20 The management computer group 300 includes a service
reservation management computer 3, a service execution
management computer 4, a users' attributes management computer
5, a condition management computer 6, service resources
allotment management computers 7, data accumulation resources
25 management computers 8, data transmission resources management

General information	
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group 300, service supply management computer 2 and end users' computers 1 are connected together via the transmission and exchange network constituting the network unit 12, whereby the service supply management computer 2 and end users' computers 1; the service supply management computer 2 and each computer in the management computer group 300; and the computers in the management computer group 300 are set communicatable with each other via the network unit 12. The communication between these parts may also be rendered possible not via the network units 12 in the high function network 100 but via other transmission and exchange network. Fig.2 shows an example in which the function of each computer in the management computer group 300 shown in Fig.1 is attained by distributed processing of the plural computers shown by the same reference numerals. The functions of these computers may also be attained by concentrated processing of a single computer.

The resources for the high function network 100 used for a service supplying operation of such network units 12 constitute, for example, transmission power, such as a transmission capacity of the network units 12.

The data accumulation computer 11 is adapted to accumulate data temporarily or permanently, and supply the service for distributing the accumulated data by utilizing the transmission and exchange service supplied by the network units 12 to the end user computers 1. To be exact, an electronic mail server,

a WWW proxy server, a cash server for domain name service, or a video cash server for distributing an image, which is sent by a user and temporarily stored, in accordance with a request made by a user correspond to the data accumulation computer 11.

Resources for the high function network 100 used for the supplying of services by the data accumulation computer 11 include resources for the accumulation capacity, transfer capacity and simultaneous distribution capacity of the data accumulation computer 11, and resources used for service supplying operations of the network units 12.

The data processing computer 13 is a computer having a data processing function. To be exact, the data processing computer 13 is an apparatus for carrying out the contraction and expansion of a video, synthesis of plural images, synthesis of plural voices, superposition of letters on an image, conversion of the color of an image, and encoding and decoding of an image. For example, a television meeting bridge which attains a multi-point television meeting by carrying out the synthesis of plural images and plural voices corresponds to this apparatus.

Resources for the high function network 100 used for the supplying of service by the data processing computer 13 constitute both the resources for transfer capacity and processing capacity of the data processing computer 13, and

resources used for service supplying operations of the network unit 12.

Each part of the management computer group 300 will now be described.

5 The users' attributes management computer 5 is adapted to hold attributes of end users and end users' computers 1.

10 The condition management computer 6 is adapted to manage, concerning every service, an actual reservation condition, and a load of logical resources for the high function network 100 in the actual reservation condition, i.e. a load of logical resources at each point in time for the high function network 100 in a case where the supplying of services is executed in accordance with the contents of the reservation.

15 The data accumulation resources management computers 8 are adapted to manage a condition of use of resources of the data accumulation computers 11 which will be described later.

 The data transmission and resources management computers 9 are adapted to manage a condition of use of resources of the network units 12 which will be described later.

20 The data processing resources management computers 10 are adapted to manage a condition of use of resources for the data processing computers 13 which will be described later.

25 The service resources allotment management computers 7 are adapted to allot services to be reserved or executed to respective resources of the high function network 100.

The service reservation management computer 3 is adapted to determine whether requested reservation is acceptable or denied while utilizing the service resources allotment management computers 7, and present a substitute plan which will be described later.

The service execution management computer 4 is adapted to determine whether execution of requested services is acceptable or denied while utilizing the service resources allotment management computers 7.

10 Each part of the service supply management computer 2
will now be described.

The service reservation units 203 are provided correspondingly to the kinds of services supplied by the high function network 100, and adapted to process requests for reservation received from the end users' computers 1 while utilizing the service reservation management computer 3.

The service execution control units 204 are provided correspondingly to the kinds of services supplied by the high function network 100, and adapted to process the requests for the execution of the services received from the end users' computers 1 while utilizing the service execution management computer 4.

The service request analysis unit 201 is adapted to analyze contents of reservation of services and those of requests for execution of the services received from the end users' computers

1.

The service type management unit 202 is adapted to manage services supplied by the high function network 100, logical levels of resources used for each service type, and the operations of the service reservation units 203 and service execution control units 204 which correspond to the kinds of services.

In that configuration, a hardware structure of each of these computers can employ a structure of a general computer 14 having a CPU 1401, a memory 1402, a storage 1403, a network interface 1404 and a bus 1405 which are shown, for example, in Fig.3. In this structure, a program 14021 and data 14022 supplied via a removable storage medium or network are stored in the memory 1402. When the CPU 1401 executes the program 14021, the processing of each part of each of the computers which will be described below is attained while the data 14022 are utilized.

An operation of the service supply system will now be described.

The operations of the service supply system of this embodiment are divided into three, i.e. a reservation service selection receiving operation, a service reservation operation and a reservation service execution control operation.

First, the reservation service selection receiving operation will be described.

Fig.4 shows a processing sequence of each part in the reservation service selection receiving operation.

As shown in the figure, the reservation service selection receiving operation is attained by a service synopsis supplying
5 sequence and a service selection receiving sequence.

First, the service synopsis supplying sequence will be described.

Fig.5 shows a procedure of a processing operation of the request for service analysis unit 201 in the service synopsis
10 supplying sequence.

In order to make a booking of services with reference to Fig.4, the end users' computers 1 transmit a request for synopsis of service to the request for service analysis unit 201 of the service supply management computer 2 (2001). The
15 request for service analysis unit 201 transfers the requests to the users' attribute management computer 5 (2002)(Step 2301 of Fig.5).

The users' attribute management computer 5 holds a users' attribute table 5001 shown in Fig.6. As shown in the figure,
20 on the users' attribute table 5001, information which includes a users' discriminator 5002 peculiar to the user, a users' name 5003, membership type 5004 representative of users type, a service discriminator 5005 representative of the services which the user subscribes, and network connection information 5006
25 indicating a position (address etc.) of the end user computers

1 on a transmission and exchange network attained by the network
units 12 is registered as user's attributes for each of all
users. For example, the user's name "Tom", the kind of
membership "Personal, economy" and the service discriminator
5 "103, 202, 212" are registered for the user having a user's
identifier "1003".

The users' attributes management computer 5, upon receipt
of the request for synopsis of service, reads out from the users'
attribute table 5001 the service discriminator and the kind
10 of membership both of which are corresponding to the user's
discriminator of the user who made the request, to deliver them
to the request for service analysis unit 201 (2003). For example,
the service discriminator "103, 202, 212" and the membership
type "Personal, economy" are delivered to the request for service
15 analysis unit 201 concerning the user having the user identifier
"1003".

The request for service analysis unit 201 transmits a
request for the name of service, which corresponds to the service
discriminator delivered thereto by the users' attributes
20 management computer 5 to the service type management unit 202
(2004, 2005) (Step 2302 of Fig.5).

The service type management unit 202 holds a service
attributes table 5101 shown in Fig.7. As shown in the figure,
on the service attributes table 5101 which includes service
25 identifier 5102, service name 5103, which includes service

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The request for service analysis unit 201 forms a synopsis of the names of the determined services (Step 2304 of Fig.5), and returns the synopsis to the end users' computers 1 (2007). The end users' computers 1 display as shown in, for

[illegible]

The above initial screen 5301 for service reservation
5 of Fig.10 is a screen for accepting requests for reservation
of the service of multi-point television meeting, economy.
This screen is used to accept participants in and starting and
finishing time of the multi-point television meeting, economy
from the users.

The above is a description of the service selection receiving sequence.

The service reservation making operation will now be described.

20 Fig.11 shows a processing sequence of each part in the
service reservation making operation.

As shown in the figure, a service reservation making operation is attained by a tentative service reservation making sequence and a service reservation making sequence.

25 First, the tentative service reservation making sequence

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	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2
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Referring to Fig.11, the end user computer 1 receives desired service starting and finishing time, and discriminators of participants it the service to be reserved is a television meeting from the users via the initial screen 5301 for service reservation as shown in Fig.10, and send them to the service reservation unit 203 (2101).

In response to this (Step 2501 of Fig.12), the service reservation unit 203 sends this received information (2102)(Step 2502 of Fig.12), service attributes obtained from the service type management unit 202 and registered on the service attribute information table 5101 for the service which reservation is requested, and a physical connection information evaluation equation which is determined in accordance with predetermined conditions, and which will be described later, to the service reservation management computer 3.

In response to this, the service reservation management computer 3 obtains the users' attributes (persons to participate in the meeting in a case where the desired service is to hold a television meeting) who are demanding service reservation

15

Then the service reservation management computer 3 determines whether or not the preparation of a substitute plan is necessary in accordance with a service executing policy held in advance(Step 2603 of Fig.13), and it determines that the

preparation of the substitute plan is necessary, prepares the substitute reservation plan and its logical connection information (2107)(Step 2604 of Fig.13).

5 The substitute reservation plan is prepared by altering a part of the logical resources of the high function network, which is indicated by variables of the logical connection information, i.e. service starting and finishing date and time and logical resources information, in accordance with service execution policies prepared in advance.

10 Examples of the service execution policies are shown in Fig.15.

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15 The service execution policies shown in Fig.15 are applied to a case where the logical resource information included in the logical connection information for the reservation uses logical resources of TVconfBridge3. When the loads of the service starting and finishing date and time for the TVconfBridge3 are not lower than 95%, not lower than 80%, not lower than 50% and lower than 50% respectively, a judgement as to whether or not the reservation is accepted, and as to
20 whether or not the substitute plan is presented, and a method of calculating the substitute plan are prescribed in accordance with the membership type of the participants.

As shown in the figure, the service execution policies are expressed by groups of if-then rules. The "if conditions"
25 are examined in order from the upper side, and, when there are

any "if conditions" whose results become real, their rules are applied, and the process described after "then" are carried out. In this case, the rules shown on the lower side of the applied rule are not applied irrespective of the results thereof.

- 5 When a person having the highest level of the membership type among the participants is a member of "individual general", and a load of the TVconfBridge3 for a desired reservation time zone is at 85%, the rule 2625 is applied. This rule indicates to search for a time zone of a load of lower than 80% in a period
- 10 of time between the time four hours before the requested time zone and that four hours after the same requested time zone without denying requested reservation, and indicates that a substitute reservation plan, in which reservation service starting and finishing date and time of the requested reservation
- 15 are changed to be held in the discovered time zone, should be prepared.

- When a person having the highest level of the membership type among the participants is a member of "individual economy" and a load of the TVconfBridge3 for a desired reservation time
- 20 zone is at 85%, the rule 2626 is applied. This rule indicates to search for a time zone of a load of lower than 80% in a period of time between the time four hours before the requested time zone and that four hours after the same requested time zone after denying requested reservation, and indicates that a
- 25 substitute reservation plan, in which reservation service

starting and finishing date and time of the requested reservation are changed to be held in the discovered time zone, should be prepared.

In this embodiment, the levels of the membership type become higher in the order of "individual economy", "individual general" and "corporation" ("corporation" is the highest). A request for reservation from a person having the membership type of "corporation" has a degree of importance higher than that of a request for reservation from a person having the membership type of "individual general", and a request for reservation from a person having the membership type of "individual general" has a degree of importance higher than that of a request for reservation from a person having the membership type of "individual economy".

The logical connection information on the substitute reservation plan includes user discriminators for all the persons that participate in the services by the substitute reservation plan, logical resource information representative of logical resources for the high function network 100 used in the services, service starting and finishing data and time and a physical connection information evaluation equation. In the case of the rule 2625 of Fig.15, user discriminators of all the participants, logical resource information and a physical connection information evaluation equation become identical with those of the logical connection information on

the requested reservation.

The requested reservation and the substitute reservation plan prepared on the basis of the results of the execution of the above-described processes will hereinafter be called
5 reservation candidate. When the substitute reservation plan is not prepared, the requested reservation only becomes the candidate reservation.

When the reservation candidate has thus been determined, the service reservation management computer 3 transmits a
10 request for allotment of the service resources with respect to all the preservation candidate to the service resources allotment management computer 7 (2108)(Step 2606 of Fig.13). During this time, logical connection information on the service resources to be used is designated.

15 When the service resources allotment management computer 7 receives this request(Step 2701 of Fig.14), the computer 7 makes a service resources allotment plan.

According to the service resources allotment plan, physical resources for the network units 12, data accumulation
20 computers 11 and data processing computers 13, which are necessary to execute the services shown by the logical connection information, are allotted to each reservation candidate.

First, the service resources allotment management computer 7 inquire from the users' attributes management
25 computer 5 about the network connection information

corresponding to the users' discriminators of all the participants indicated by the logical connection information registered on the users' attributes table 5001 to obtain the network connection information, said information is obtained
5 (Step 2702 of Fig. 14).

Then the service resources allotment management computer 7 selects all groups of physical resources corresponding to the logical resources indicated by the logical resources information of the logical connection information are selected
10 by using a data accumulation resources management table 2650 and a data processing resources management table 2660 which are held in advance, and the network connection information corresponding to the users' discriminators of all the participants indicated by the previously obtained logical
15 connection information (Step 2703 of Fig. 14).

Fig. 16 shows an example of the data accumulation resources management table 2650. This data accumulation resources management table 2650 is provided on the assumption that the data accumulation computers 11 are used as video cash servers.
20 Concerning every physical resource, logical resource 5402 to which the physical resource belongs, a physical resource discriminator 5403, a computer discriminator 5404 of the data accumulation computers 11 in which the physical resource is provided, and a total amount of the physical resource is
25 registered on the table 2650. In this example, a combination

of the number of acceptable reservation 5405, a maximum transfer speed 5406 and a maximum number of clients (number of the end users' computers 1 to which video data can be transmitted at once) 5407 are registered as a total amount of the physical resource.

Fig.17 shows an example of the data processing resources management table 2660. This data processing resources table 2660 is provided on the assumption that the data processing computers 13 are used as apparatuses for subjecting television meeting bridge or processing a superimposition on image data. Concerning every physical resource, logical resource 5502 to which the physical resource belongs, a physical resources discriminator 5503, a computer discriminator 5504 for the data processing computers 13 in which the physical resource is provided, and a total amount of the physical resources are registered on the table 2660. In this example, a combination of the number of acceptable reservation 5505, a maximum transfer speed 5506 and a maximum number of connection (number of end users' computers 1 capable of participating a television meeting at once) 5507 is registered as a total amount of the physical resources.

Each of the physical resources groups selected forms a group of one of the physical resources corresponding to the logical resources indicated by the logical resources information of the logical connection information registered

on the data accumulation resources management table 2650 and data processing resources management table 2660, and physical resources (i.e. transmission and exchange network or a combination thereof) for the network units 12 capable of forming one path, between the end users' computers 1 indicated by the one of the physical resources and the network connection information by transmission capacity and transmission quality indicated by the logical connection information.

After a group of physical resources has thus been selected, physical connection information candidate is selected by using a reservation management table 35 shown in Fig.18 (Step 2704 of Fig.14).

The reservation management table 35 is formed for each reservation set or temporarily set, so as to include a reservation number 5602, reservation type 5603, physical connection information 5604 and starting and finishing date and time 5605, 5606. In the reservation type 5603 in this example, either "real reservation" indicative of properly set reservation or "tentative reservation" indicative of tentatively set reservation is set. The physical connection information 5604 indicates physical resources used for reserved service and a using amount of the resources used for the service. The starting and finishing date and time 5605, 5606 represent the time at which the reserved service is executed.

Namely, in a Step 2704 of Fig.14, the following operation

is carried out. As to the service for reservation candidate being processed, assumed that the service for the reservation registered as "real reservation" on the reservation management table 35 is executed in accordance with the starting and finishing date and time, set with respect to the reservation, during the time between the service starting and finishing time designated in the logical connection information by using a group of physical resources and a using resource amount indicated by the physical connection information set with respect to the mentioned reservation. In that case, all groups of physical resources in which the sum of resources required to execute each physical resource belonging to the group of the physical resources do not exceed the total amount of the physical resources when the group of the physical resources is executed by using the amount of resources written in the logical resources information in the logical connection information, are extracted. Each extracted group of physical resources is determined as physical connection information candidate in which the amount of resources written in the logical resources information is set as a using resource amount. With respect to this physical connection information candidate, the service starting and finishing data and time indicated by the logical connection information is set as starting and finishing date and time. A total amount of the physical resources for the transmission and exchange network is set as a total

Consequently, the service resources allotment management computer 7 changes the reservation type having the reservation number whose real reservation was demanded to "real reservation" in the reservation management table 35 (Step 3002 of Fig.21), and deletes from the reservation management table 34 the reservation (their reservation type is "tentative reservation" at this time) of reservation numbers whose cancellation was demanded (Step 3003 of Fig.21).

The success in making real reservation is notified to the service reservation management computer 3 (2120) (Step 3004 of Fig.21).

Consequently, the service reservation management computer 3 notifies the service reservation units 203 that making real reservation has finished (2121), and sends (Step 2805 of Fig.21) to the condition management computer 6 the reservation number and the logical connection information stored in Step 2606 shown in Fig.13 corresponding to the reservation number of which the making of real reservation succeeded. The condition management computer 6 adds the reservation represented by the received logical connection information to the present reservation condition managed thereby. The condition management computer 6 calculates for every service on the basis of this reservation condition and a total amount of each logical resources for each service held in advance, the load of logical resources, at each point in time, for the

will be described.

Fig.23 shows a procedure for a processing operation of the service request analysis unit 201 in the service execution control starting sequence.

5 Referring to Fig.22, the end user's computer 1 designates a service discriminator representing the service whose execution is requested, the service request analysis unit 201, and request for storing the service execution control operation (2201).

10 When the service request analysis unit 201 receives this request(Step 3101 of Fig.23), it obtains information on the service execution control unit 2 corresponding to the service designated by the service discriminator from the service type management unit 202 (2202, 2203)(Step 3102 of Fig.23), to start
15 the service execution control unit 2 concerned (2204)(Step 3103 of Fig.23). The started service execution control unit 2 forms an initial screen for the service execution control operation, and delivers this to the service request analysis unit 201 (2206).
The service request analysis unit 201 transfers the initial
20 screen to the end user's computer 1 (2207)(Step 3104 of Fig.23). The end user's computer 1 displays the received initial screen.

The service execution control starting sequence has been described above.

The service execution control sequence will now be
25 described.

A procedure for a processing operation of the service execution controller 2, service execution management computer 4 and service resources allotment management computer 7 in the service execution control sequence is shown in Figs.24, 25 and 26.

Referring to Fig.22, the end user's computer 1 transmits the reservation number whose making of real reservation has already finished to the service execution control unit 204 to request for starting the service reserved in the reservation (2208).

When the service execution control unit 204 receives this request (Step 3201 of Fig.24), it refers to the logical connection information and the groups of the reservation number held in itself, and notifies the denial of the request to the end user's computer 1 when there is not logical connection information corresponding to the reservation number concerning the request, or when there is not the present time between the service starting time and service finishing time which are indicated by the logical connection information corresponding to the reservation number concerning the request. When there is the present time between the service starting time and service finishing time which are indicated by the logical connection information corresponding to the reservation number concerning the request, this request is transferred to the service execution management computer 4 (2209)(Step 3202 of Fig.24).

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The service execution management computer 4 receives this request (Step 3301 of Fig.26), and transfers it to the service resources allotment management computer 7 (2201)(Step 3302 of Fig.25).

5 When the service execution allotment management computer
7 receives (Step 3401 of Fig.25), it takes out (Step 3402 of
Fig.26) the physical connection information on the reservation
corresponding to the reservation number concerning the request
from the reservation management table 35. Next, as to each
10 of the physical resources included in the physical connection
information, the service execution allotment management
computer 7 requests for allotment of resources of using resource
amount indicated by the physical connection information of the
physical resources to the data accumulation resources
15 management computer 8, the data transmission resources
management computer 9 and the data processing resources
management computer 10 which manage the physical resource
(2211)(Step 3403 of Fig.26).

20 The data accumulation resources management computer 8,
the data transmission resources management computer 9 and the
data processing resources management computer 10 notify
allotment success to the service resources allotment management
computer 7 when there is room whose volume corresponds to the
using resource amount requested, among the physical resource
25 which is requested for the allotment (2212).

When the service resources allotment management computer 7 to confirm that the allotment of all service resources succeeded by this notification, the computer 7 notifies the allotment success and the physical connection information on the reservation number concerning the request to the service execution management computer 4 (2213)(Step 3404 of Fig.26).

Owing to this notification, the service execution management computer 4 confirms that the allotment succeeded (Step 3303 of Fig.25), and notifies the received physical connection information and the success of the request to the service execution control member 204 (2214)(Step 3304 of Fig.25).

Owing to this notification, the service execution management computer 4 judges whether or not the request was succeeded (Step 3203 of Fig.24). When the request was succeeded, and the requested service is a television meeting, the designation of the service and a request for the participation in the service are notified with the received physical connection information to the end users' computers 1 of all the participants in the service except the user who requested for the service (2215)(Step 3204 of Fig.24).

The success in the starting of the service is notified with the received physical connection information to the end user's computer 1 which requested for the service (2216)(Step 3205 of Fig.24).

Therefore, reservation of a high degree of importance can be accepted preferentially with a high probability. In addition, reservation of a low degree of importance once accepted is not cancelled later. Furthermore, when the utilization of the services based on a substitute reservation plan in which a part only of the contents of a user's desired reservation is changed, i.e., the contents of a user's desired reservation are respected to a predetermined extent is recommended to the users, whereby the users' reservation can be induced in the direction in which the utilization efficiency of resources increases.

Therefore, in the this embodiment, the utilization efficiency of resources and the degree of the users' satisfaction concerning the utilization of services can be optimized.

In this embodiment, as a substitute reservation plan, a case where the service starting and finishing time out of variables constituting the contents of reservation requested by a user is changed by using the service operating policies shown in Fig.15 is described. However, it may be determined arbitrarily in accordance with the environment and condition of the service supply system and the operator's policy what kind of variable among the variables constituting the contents of reservation should be changed to prepare a substitute reservation plan to be presented. The variables out of variables constituting the contents of the reservation

Although the resources are managed in two stages, i.e., in stages of logical resources and physical resources in this embodiment, the managing of the resources may also be done in one stage only. In both of these cases, the unit of the resources

The techniques in this embodiment for denying reservation in accordance with the load of resources and the degree of importance of the reservation, and presenting a substitute plan can be applied in the same manner to an arbitrary system for supplying service by using certain resources besides the high function network shown in this embodiment.

[illegible]

24 requests if the degree of importance of the service booking
25 requests determined by the importance degree determining
26 element is not lower than the predetermined importance degree.

1 2. A service reservation system according to claim 1, wherein
2 said predetermined standard is a standard at which the
3 predetermined importance degree increases in proportion to the
4 load level of resources in a period of time of execution of
5 object service relative to the reservation booking request.

1 3. A service reservation system adapted to accept from users
2 requests for reservations for utilizing services supplied by
3 using resources, comprising:

4 a reservation condition management element adapted to
5 manage accepted reservations of services as reservation
6 condition;

7 a first acceptance element adapted to accept service
8 booking requests from users,

9 a substitute reservation plan preparation element
10 adapted to prepare at least one substitute reservation plan
11 which is obtained by at least partially altering the contents
12 of reservation in the reservation booking requests accepted
13 by the first acceptance element, in such a manner that a general
14 resources utilization efficiency increases in accordance with
15 the contents of the reservation and a load level of resources

16 used for supplying of the object services relative to the
17 reservation booking requests, said load level being determined
18 by the reservation condition managed by the reservation
19 condition management element;

20 a substitute reservation plan presentation element
21 adapted to present said at least one substitute reservation
22 plan which is prepared by the substitute reservation plan
23 preparation element, to the users;

24 a second acceptance element adapted to accept the user's
25 selection of said at least one substitute reservation plan;
26 and

27 a reservation element adapted to accept as reservation
28 the substitute reservation plan whose selection is accepted
29 by the second acceptance element.

1 4. A service reservation system according to claim 1, further
2 comprising:

3 a substitute reservation plan preparing element adapted
4 to prepare, when the acceptance of the reservation in the
5 reservation booking request is denied by the reservation taking
6 element, at least one substitute reservation plan which is
7 obtained by at least partially altering the contents of
8 reservation in the reservation booking requests accepted by
9 the first acceptance element, in such a manner that a general
10 resource utilization efficiency increases in accordance with

22 said reservation taking element accepts as reservation
23 the substitute reservation plan whose selection is accepted
24 by the second selection accepting element.

3 a substitute reservation preparation element adapted
4 to prepare, when the acceptance of the reservation in the
5 reservation booking request is allowed by the reservation taking
6 element, at least one substitute reservation plan which is
7 obtained by at least partially altering the contents of
8 reservation in the reservation booking request accepted by the
9 first acceptance element, in such a manner that a general
10 resource utilization efficiency increases in accordance with

11 the contents of the reservation and a load level of resources
12 used for the supplying of the object services relative to the
13 reservation booking request, said load level being determined
14 by the reservation condition management element;

15 a substitute reservation plan presentation element
16 adapted to present said at least one substitute reservation
17 plan which is prepared by the substitute reservation plan
18 preparation element, to the users; and

19 a second acceptance element adapted to accept the user's
20 selection of the substitute reservation plan or the reservation
21 allowed by the reservation taking element; wherein

22 said reservation taking element accepts the substitute
23 reservation plan as reservation when its selection is accepted
24 by the second acceptance element; and said reservation taking
25 element accepts when its selection is accepted by the second
26 acceptance element.

1 6. A service supplying system adapted to supply services by
2 using resources, comprising the service reservation system
3 defined in claim 1, wherein said resources supplying services
4 in accordance with the reservation accepted by the service
5 reservation system.

1 7. A service supplying system according to claim 6, wherein:
2 said resources include a transmission and exchange

8 a reservation condition management element adapted to
9 manage the accepted reservation of services as reservation
10 conditions;

11 a first acceptance adapted to accept service booking
12 requests from users;

13 an importance degree determining element adapted to
14 determine in accordance with preset specifications a degree
15 of importance of the service booking requests accepted by the
16 first acceptance element; and

17 a reservation taking element adapted to, when a load level,
18 which is determined depending upon the reservation condition
19 managed by the reservation condition management element, of
20 resources used for supplying object services relative to the
21 service booking requests accepted by the first acceptance
22 element is higher than a predetermined level, deny the acceptance
23 of the service booking requests if the degree of importance
24 of the service booking requests determined by the importance
25 degree determining element is lower than a predetermined
26 importance degree determined by a predetermined standard and
27 permit the acceptance of the service booking requests if the
28 degree of importance of the service booking requests determined
29 by the importance degree determining element is not lower than
30 the predetermined importance degree.

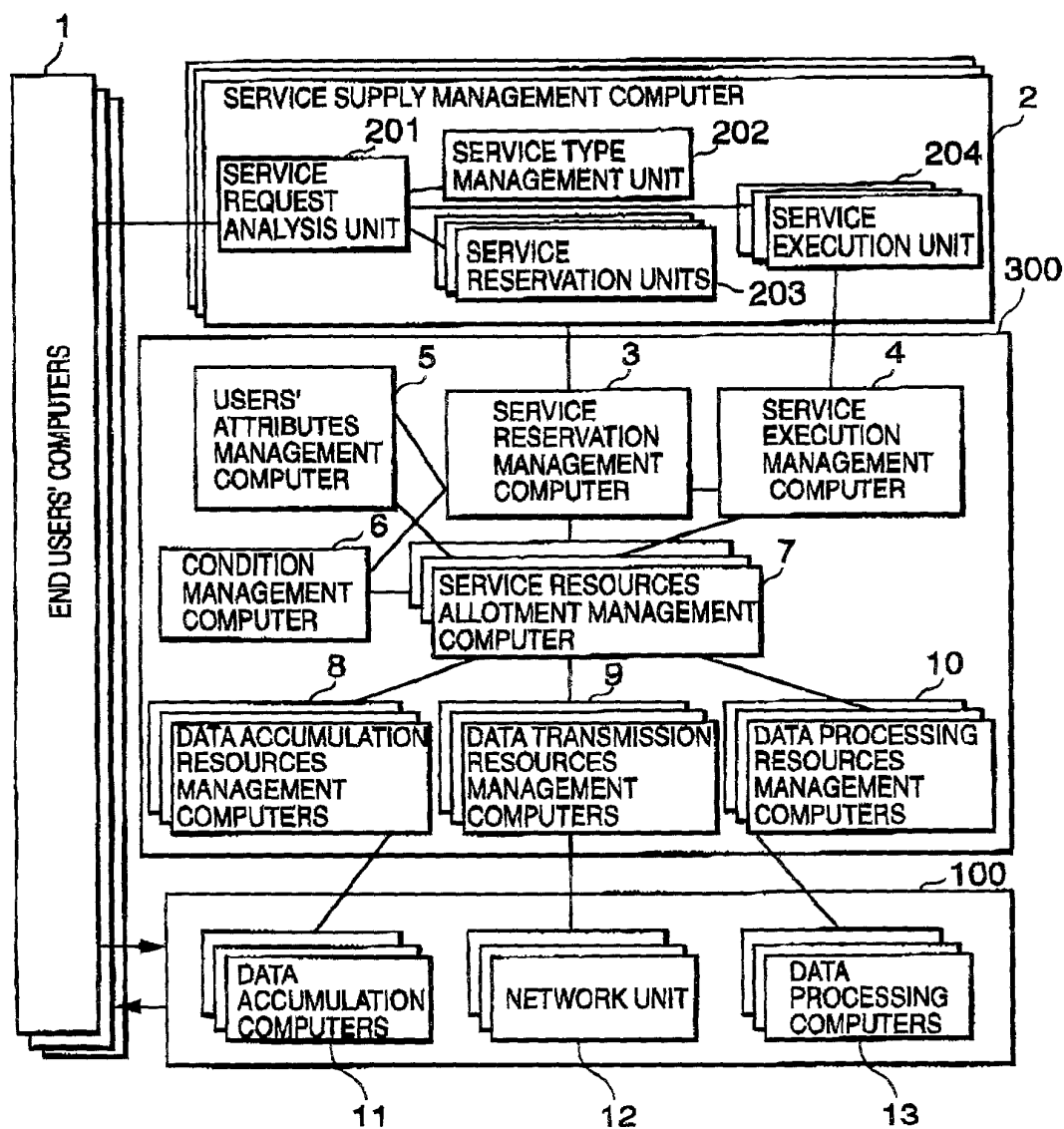
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ABSTRACT OF THE DISCLOSURE

The degree of users' satisfaction concerning the utilization of services and the utilization efficiency of resources used for the services are optimized. The service reservation management computers deny on the basis of the degree of importance as a standard, which increases in proportion to a level of a load of resources utilized for the service supplied by a high function network, a reservation booking request which has a degree of importance not higher than the standard, and which was received from an end user's computer via a service supply management computer, even when an amount of resources used for the service in a case where the reservation is accepted with the service then executed in accordance with the reservation booking request does not exceed an amount of resources utilizable for the service. In order that the resources utilization efficiency increases, a substitute reservation plan in which the contents of the reservation are altered is prepared, and this substitute plan is presented to the user via the service supply management computer to thereby accelerate the user's utilization of the service according to the substitute plan.

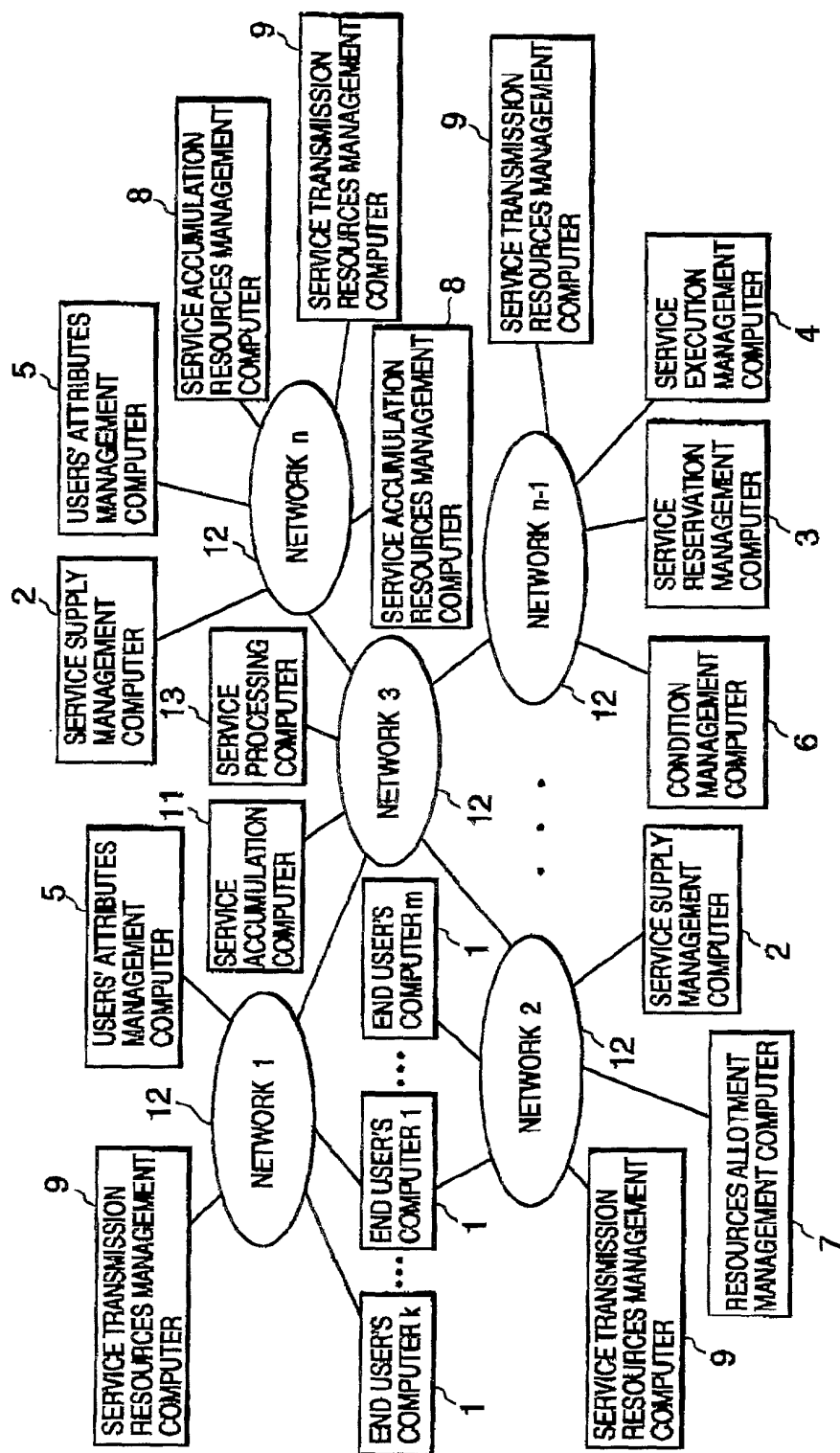
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FIG. 1

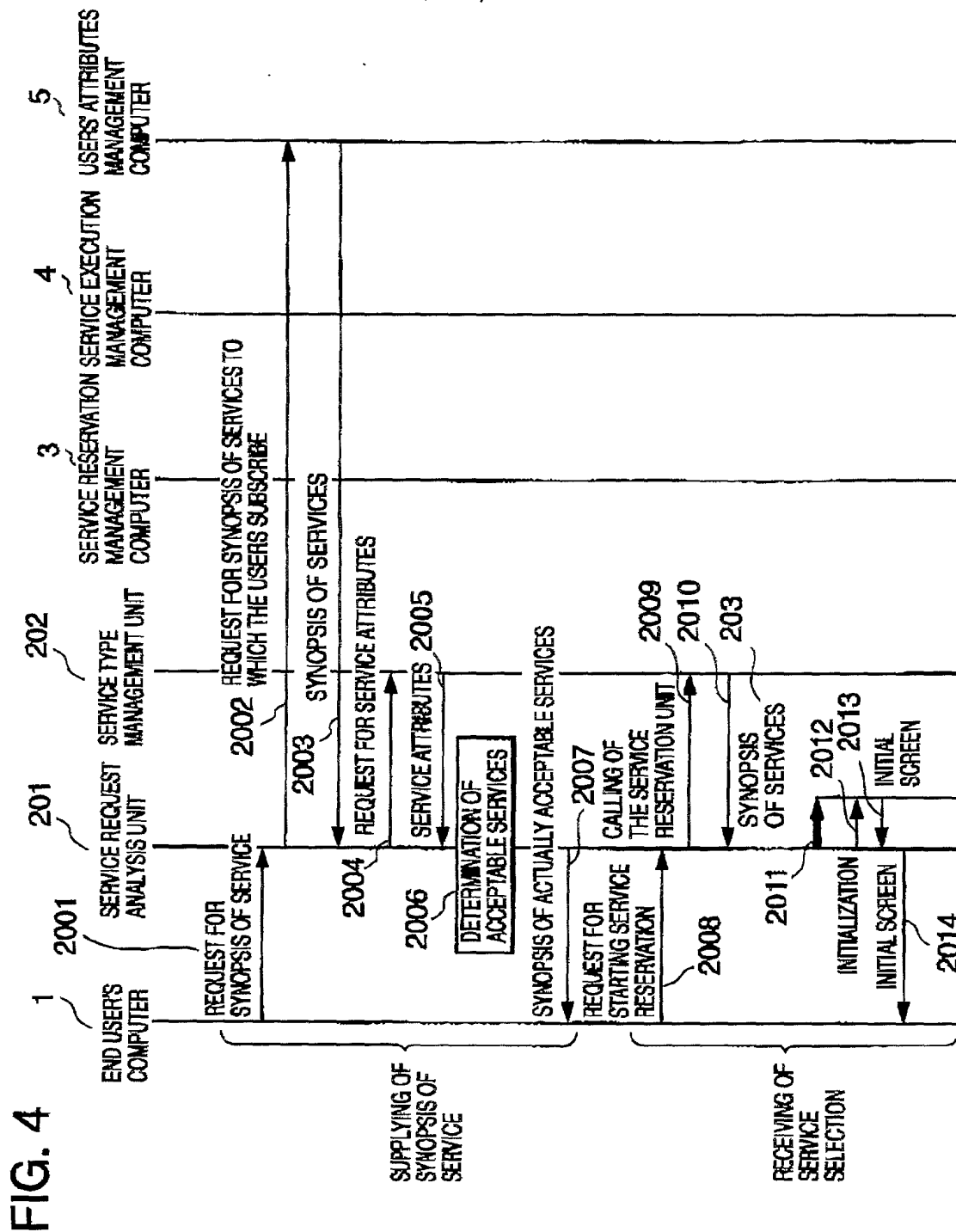


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FIG. 2

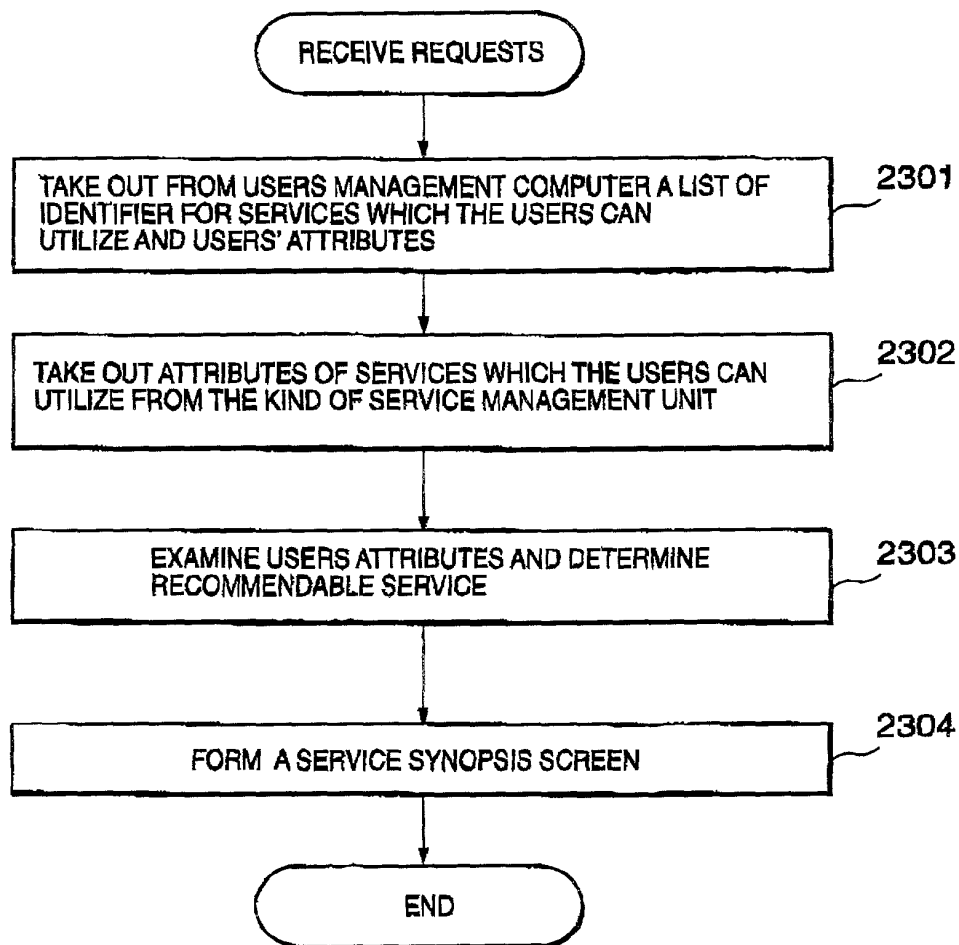


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FIG. 5



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FIG. 6

5002		5003	5004	5005	5006	5001
USER DISCRIMINATORS	NAME OF USERS	KIND OF MEMBERSHIP	SUBSCRIPTION SERVICE	NETWORK CONNECTION INFORMATION		
1001	HITACHI	CORPORATION	101,102			...
1002	JOHN	INDIVIDUAL STANDARD	102,103,201,211			...
1003	TOM	INDIVIDUAL ECONOMY	103,202,212			...

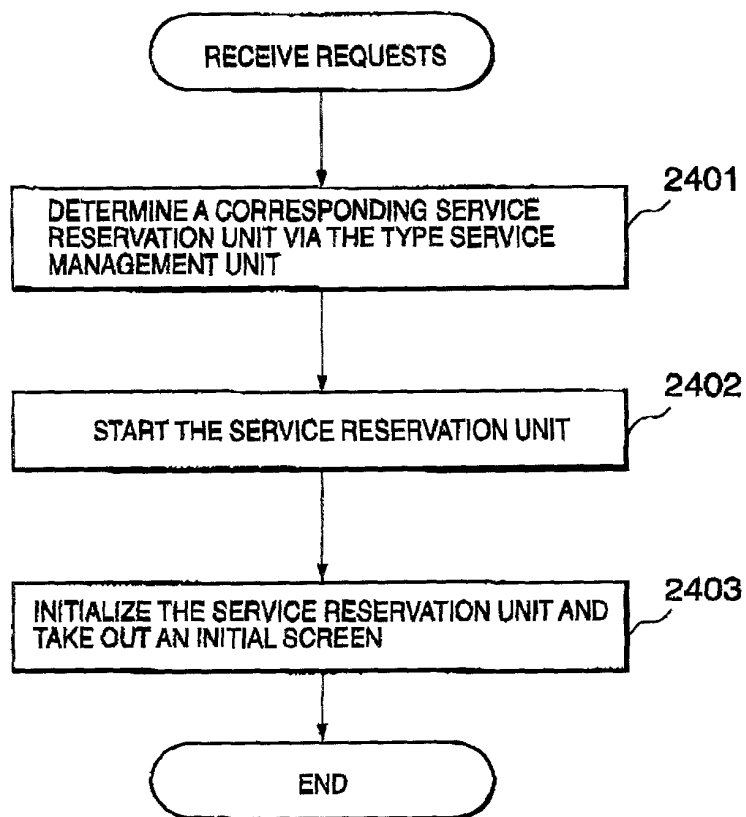
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FIG. 7

5102			5103		5104		5105		5106	5101
SERVICE IDENTIFIER	NAME OF SERVICES		LOGICAL RESOURCES INFORMATION		SERVICE RESERVATION UNIT		SERVICE EXECUTION CONTROL UNIT			
101	MULTI-POINT TELEVISION MEETING (HIGH IMAGE QUALITY)		6.3Mbps, LOW DELAY, TVConfBridge							
102	MULTI-POINT TELEVISION MEETING (INTERMEDIATE IMAGE QUALITY)		1.5Mbps, LOW DELAY, TVConfBridge							
103	MULTI-POINT TELEVISION MEETING (ECONOMY)		100Kbps, TVConfBridge							
201	PREVIEW OF A NEWLY PRODUCED MOTION PICTURE (HIGH IMAGE QUALITY)		6.3Mbps, MPEGserver							
202	PREVIEW OF A NEWLY PRODUCED MOTION PICTURE (LOW CHARGE)		1.5Mbps, MPEGserver							
211	MAIN COMPILATION OF A NEWLY PRODUCED MOTION PICTURE (HIGH IMAGE QUALITY)		6.3Mbps, MPEGserver							
212	MAIN COMPILATION OF THE NEWLY PRODUCED MOTION PICTURE (LOW CHARGE)		1.5Mbps, MPEGserver							

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FIG. 9



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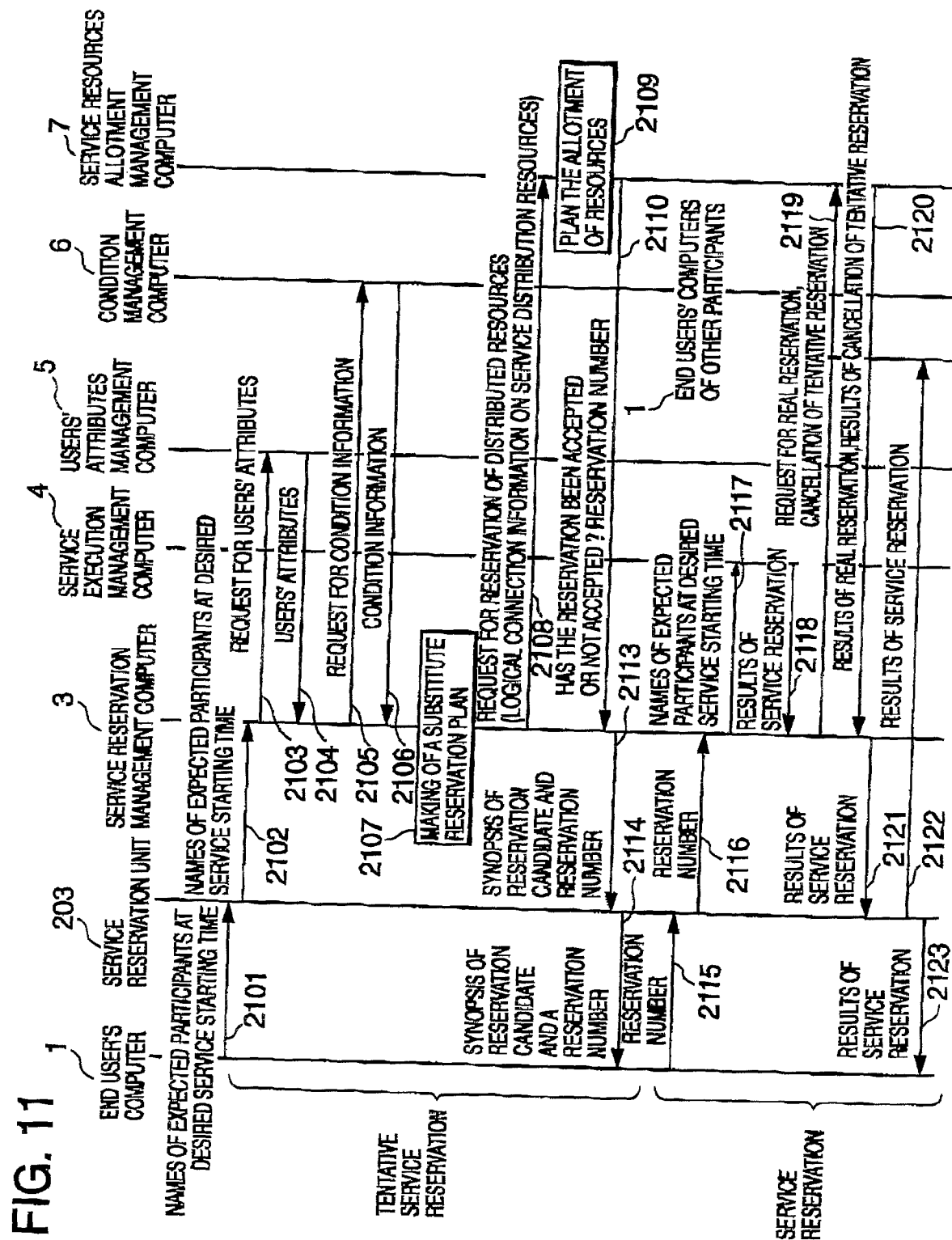
FIG. 10

5301

MAKE A RESERVATION BOOKING REQUEST FOR A MULTI-POINT TELEVISION MEETING (ECONOMY)									
PARTICIPANT 1			JOHN						
PARTICIPANT 2			HITACHI						
PARTICIPANT 3			—						
STARTING TIME		4	MONTH	1	DATE	15	HOUR	00	MINUTE
ENDING TIME		4	MONTH	1	DATE	17	HOUR	00	MINUTE
APPLICATION									

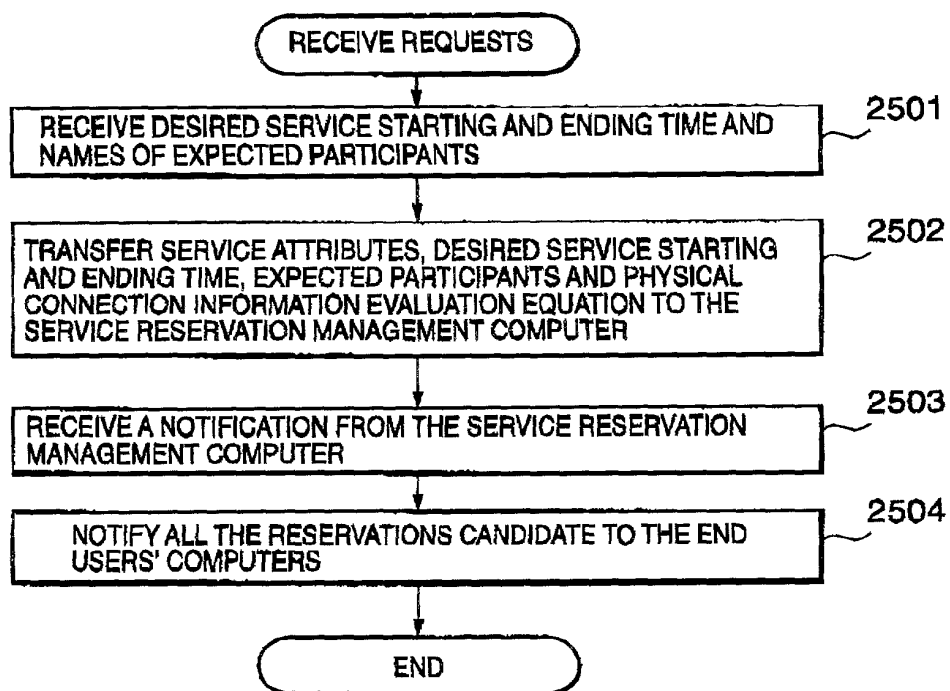
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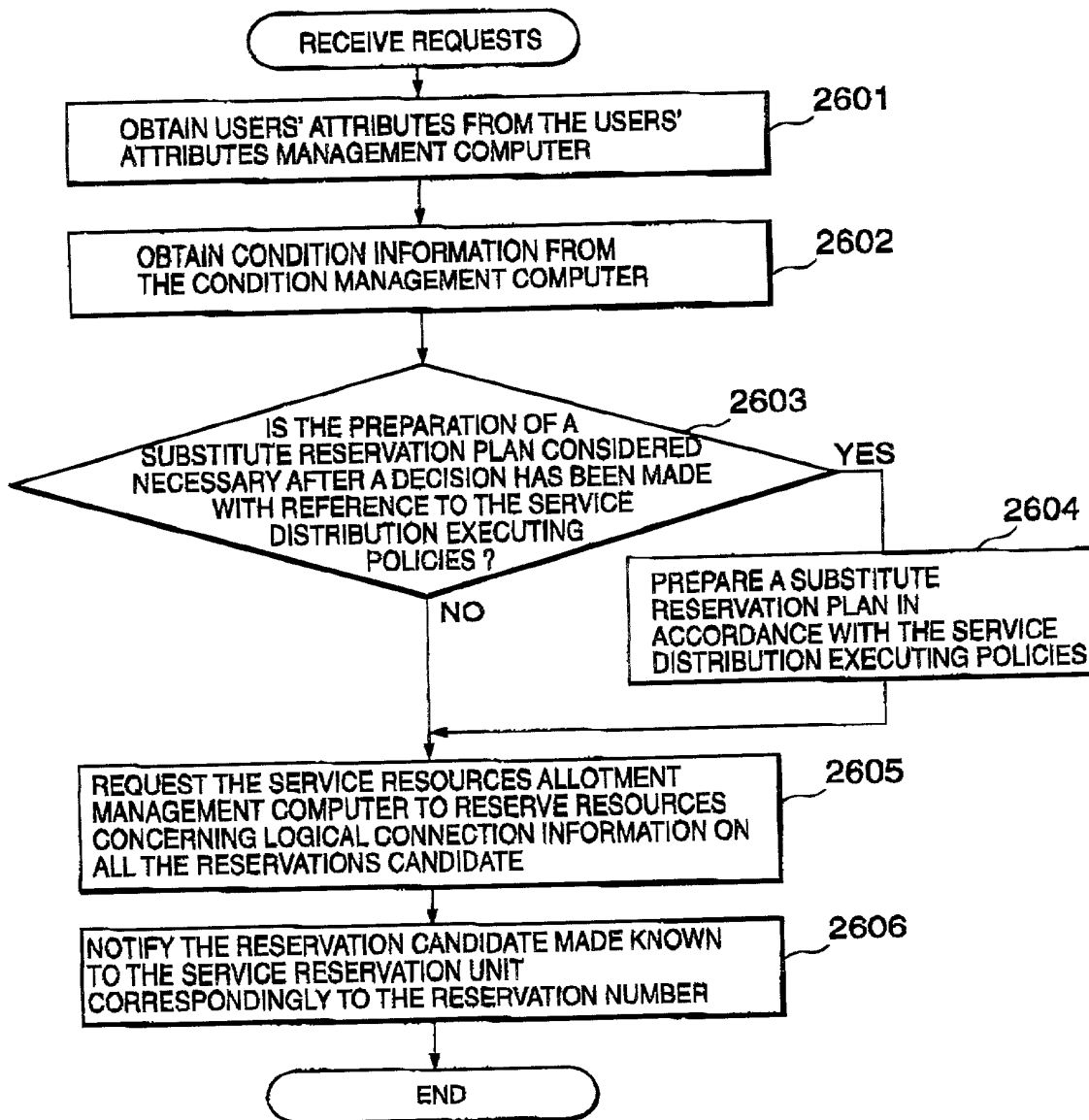
FIG. 12



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FIG. 13



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FIG. 16

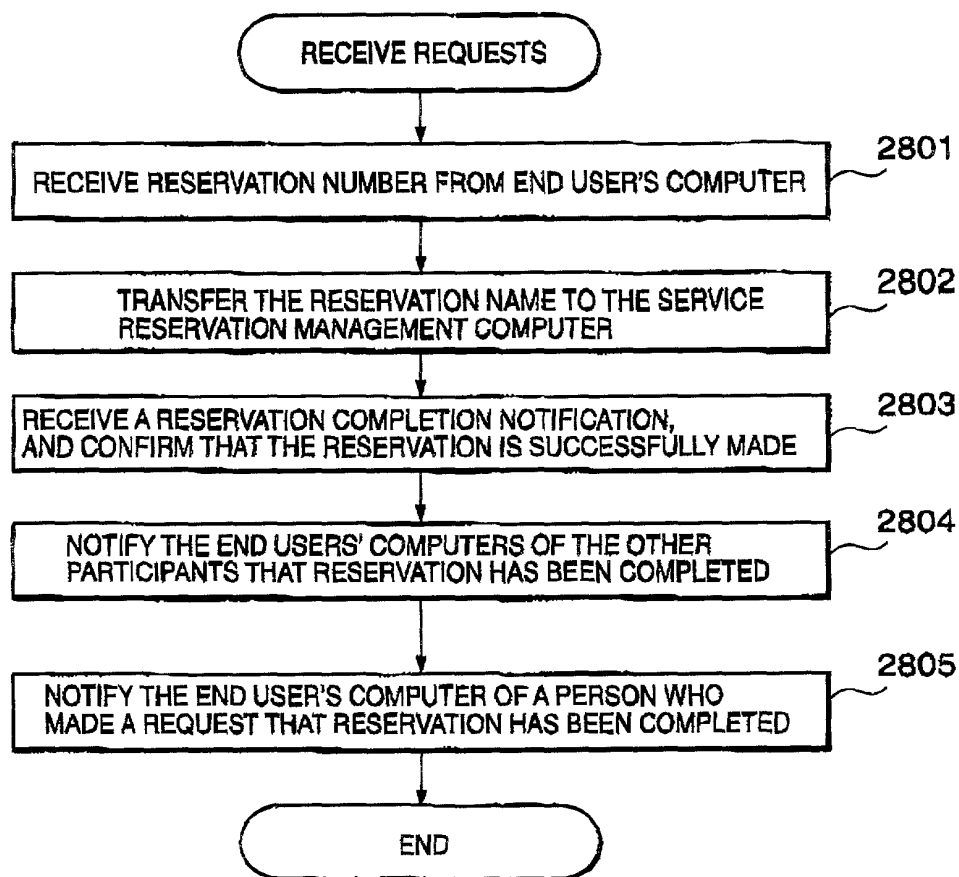
5402		5403	5404	5405		5406		5407
LOGICAL RESOURCES	PHYSICAL RESOURCES DISCRIMINATOR	COMPUTER DISCRIMINATOR	NAME OF ATTRIBUTE 1	ATTRIBUTE VALUE 1	NAME OF ATTRIBUTE 2	ATTRIBUTE VALUE 2	NAME OF ATTRIBUTE 3	ATTRIBUTE VALUE 3
MPEG2CacheOnDemand	MPEG2CacheOnDemand_1	MPEGCache_1	RECEIVABLE NUMBER OF RESERVATION	10	MAXIMUM TRANSFER SPEED	6Mbps	MAXIMUM NUMBER OF CLIENTS	5
MPEG2CacheBroadcast	MPEG2CacheBroadcast_1	MPEGCache_2	RECEIVABLE NUMBER OF RESERVATION	5	MAXIMUM TRANSFER SPEED	6Mbps	MAXIMUM NUMBER OF CLIENTS	100
MPEG1CacheOnDemand	MPEG1Cache_1	MPEGCache_1	RECEIVABLE NUMBER OF RESERVATION	10	MAXIMUM TRANSFER SPEED	1.5Mbps	MAXIMUM NUMBER OF CLIENTS	20
MPEG1CacheBroadcast	MPEG1Cache_1	MPEGCache_2	RECEIVABLE NUMBER OF RESERVATION	5	MAXIMUM TRANSFER SPEED	1.5Mbps	MAXIMUM NUMBER OF CLIENTS	20

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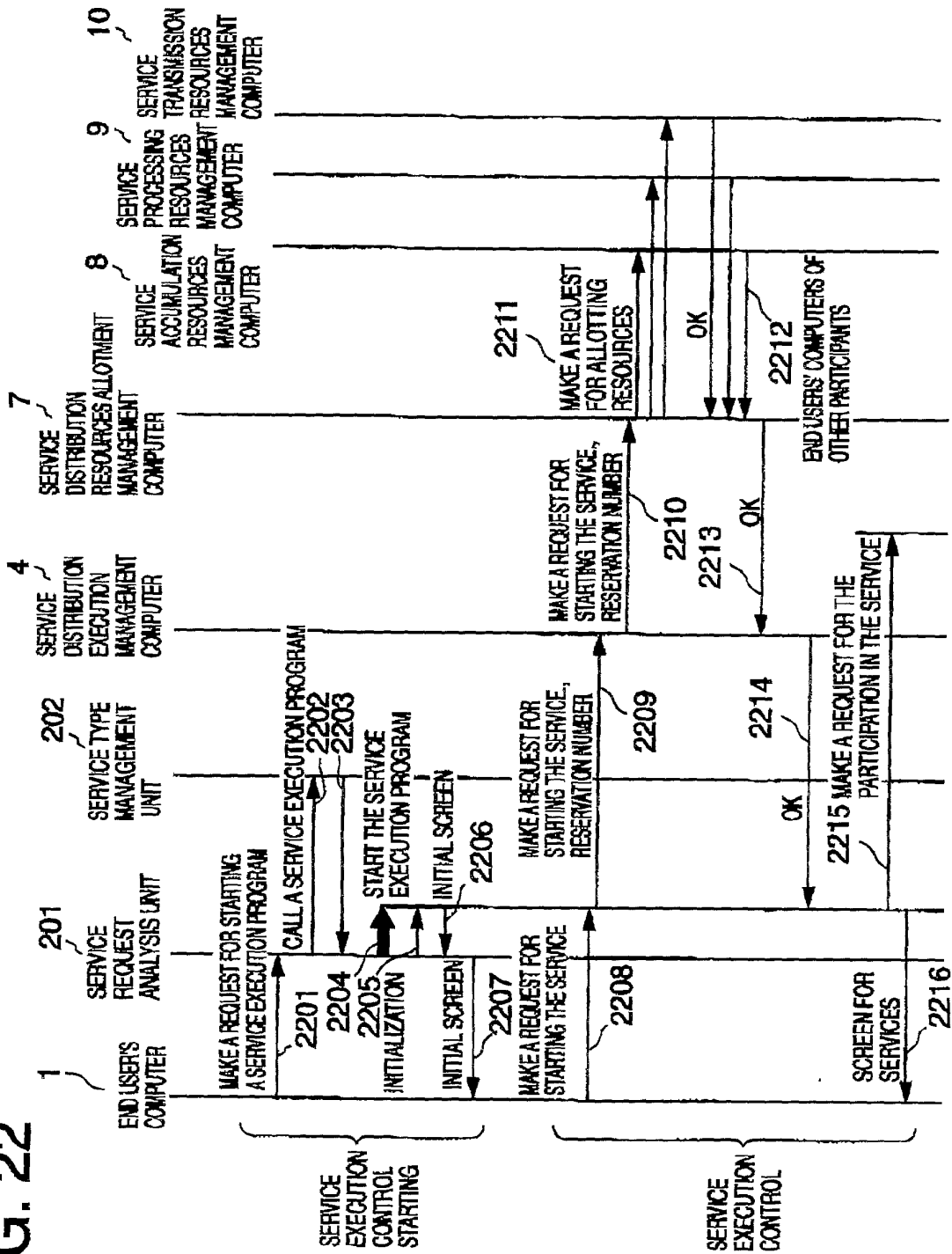
FIG. 19



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FIG. 22



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